



PORTLAND CEMENT CONCRETE FOR EARLY OPEN PAVEMENT MSP-91-11B

1.0 Description. At the contractor's option in order to expedite operations, pavement concrete may be furnished as modified by this specification.

1.1 Unless otherwise stated, specification section references are from the version, in effect at the time of this contract, of the Missouri Standard Specifications for Highway Construction and its supplements.

1.2 The mix design, materials, and curing operation herein described are to provide for opening to all traffic when the concrete is seventy two hours old, provided the concrete strength is at least 3500 psi (24 MPa). If this option is chosen, all requirements herein described shall be followed.

2.0 Materials. All materials shall conform to Division 1000, Materials Details unless otherwise noted.

2.1 A water reducer shall be used, except that Type F or G water reducers will not be allowed.

2.2 Type I, II, or III cement may be used. Fly Ash may be used.

2.3 A non-chloride accelerating admixture may be used.

3.0 Concrete Mix Design. Concrete shall comply with the requirements for pavement concrete in Sec 501, except as modified herein.

3.1 The proposed mix design shall be submitted, by the contractor, in writing to the engineer for approval at least forty five days prior to use of the mix.

3.1.1 The design shall include type and source, physical characteristics, proportions, and scale weights of all materials. It shall also include actual laboratory test results indicating mix proportions, slump, air content, strength (in pounds per square inch, psi) (in megapascals, MPa), and age (from molding to testing) of 6 inch x 12 inch (152.4 mm x 304.8 mm) cylinders made from concrete produced in accordance with the proposed mix design.

3.1.2 Molding, testing, and curing should replicate field anticipated conditions. Minimum cylinder testing shall be two cylinders, each, for twenty four, forty eight, and seventy two hours of age. The seventy two hour test cylinders shall exceed 3500 psi (24 MPa).

3.2 Type III cement may be used with no change in the required cement factor. If Type I or II cement is used, the cement requirement shall be increased by 94 pounds per cubic yard (55.7 kilograms per cubic meter).

3.3 The water/cement ratio of pounds (kilograms) of water to pounds (kilograms) of cement shall not exceed 0.40 for design or during operations.

3.4 The design percent air in the mortar shall be 9.0, plus or minus 1.0 percent, at the specified air content.

4.0 Construction. All requirements of Sec 502 shall apply except as modified herein.

4.1 Curing.

4.1.1 The concrete shall be cured until the minimum strength and age requirements have been met. Cylinder test specimens shall be cured in the same manner as the pavement.

4.1.2 Immediately after the surface has been textured, the concrete shall be cured using a white-pigmented curing compound, applied to the surface and exposed edges at the rate of 1 gallon per 100 square feet (4 liters per square meter).

4.1.3 The contractor is advised that the rate of strength gain is directly related to the amount of heat retained in the concrete during the curing process. If a cover material is used to accelerate the strength gain, the cover material shall be uniform, impermeable to moisture, and sufficiently durable to remain intact until the end of the curing time. Cover material that will not remain intact or that is otherwise perforated shall not be used.

4.2 Joints. All joints shall be sawed as soon as possible without causing excessive raveling, but before uncontrolled shrinkage cracking occurs.

4.3 Opening to Traffic. The concrete pavement shall not be opened to light traffic until the concrete is at least forty eight hours old and has attained a minimum compressive strength of 3000 psi (21 MPa). The pavement shall not be opened to all types of traffic until the concrete is at least seventy two hours old and has attained a minimum of 3500 psi (24 MPa). In addition, all joints in the new slab shall be sawed, cleaned, and sealed in accordance with the details shown on the plans.